N5 Chemistry
Unit 1: Chemical Changes & Structure
Homework 1.12

1. Which of the following numbers is the same for lithium and sodium?

   A Mass number
   B Atomic number
   C Number of outer electrons
   D Number of occupied energy levels

   Answer _____

2. Atoms of an element form ions with a single negative charge and an electron arrangement of 2, 8.
   The element is

   A fluorine
   B lithium
   C sodium
   D neon.

   Answer _____

3. A neutral solution contains

   A neither hydrogen ions nor hydroxide ions
   B equal numbers of hydrogen ions and hydroxide ions
   C more hydrogen ions than hydroxide ions
   D more hydroxide ions than hydrogen ions.

   Answer _____

4. The electron arrangement of a sulfide ion is the same as that of

   A Helium
   B Neon
   C Argon
   D Krypton.

   Answer _____

5. Carbon was burned in oxygen. Water was added to the gas jar and the pH measured.
   The pH value was found to be

   A 4
   B 7
   C 9
   D 13.

   Answer _____

6. Which of the following substances dissolves in water to give a solution of pH less than 7?

   A Sodium oxide
   B Magnesium hydroxide
   C Sulfur dioxide
   D Sodium chloride

   Answer _____

7. The conductivity of pure water is low because

   A water contains only molecules
   B only a few molecules are ionised
   C water contains free electrons
   D there are equal numbers of hydrogen and hydroxide ions in water.

   Answer _____

8. During the first 20 seconds of a chemical reaction, 5·0 cm^3 of gas were given off.
   The average rate of the reaction, in $cm^3\ s^{-1}$, during the first 20 seconds is

   A 20·0
   B 5·0
   C 4·0
   D 0·25

   Answer _____

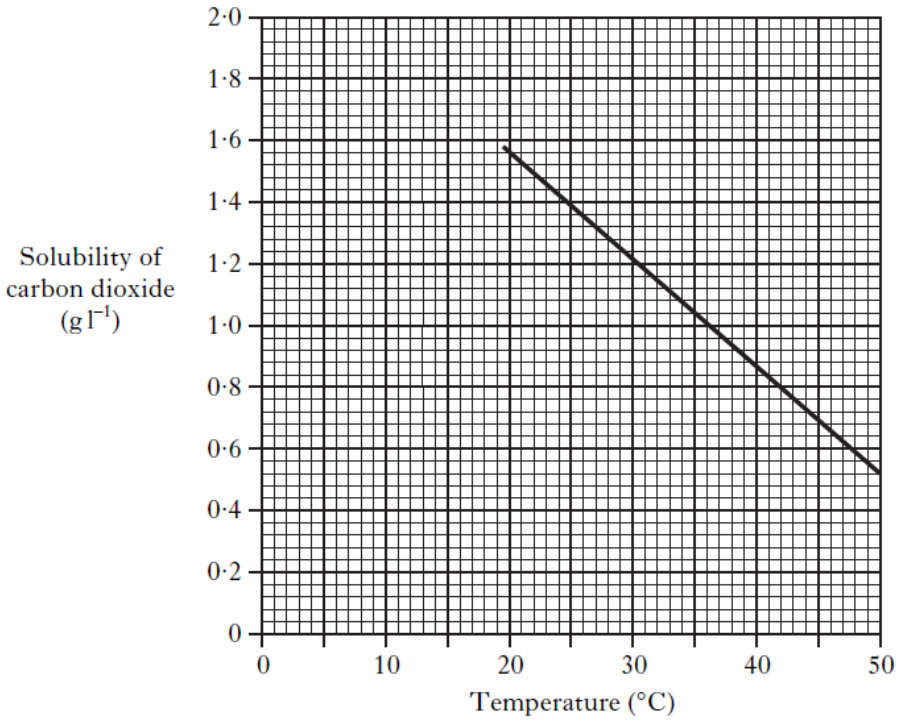
9. People often drink lemonade to quench their thirst.

a) Lemonade contains citric acid. Suggest a pH value for lemonade.

_____ 1

b) To make the drink fizzy, carbon dioxide gas is added to the lemonade. The solubility of carbon dioxide gas depends on the temperature of the lemonade.

The graph below shows how the solubility of carbon dioxide gas changes with temperature.



i) Write a general statement describing the effect of temperature on the solubility of carbon dioxide gas.

_____

_____ 1

ii) Use the graph to predict the solubility of carbon dioxide at 10°C.

_____ g l^{-1} 1

10. The grid shows information about some particles.

A $^{23}_{11}Na$	B $^{18}_{8}O$	C $^{40}_{19}K^{+}$
D $^{24}_{12}Mg^{2+}$	E $^{35}_{17}Cl^{-}$	F $^{16}_{8}O$

a) Identify the **two** particles with the same number of neutrons.

Answer _____ & _____ 1

b) Identify the particle which has the same electron arrangement as neon.

Answer _____ 1

11. Atoms contain protons, neutrons and electrons. The nuclide notation of the sodium atom is:

$$^{24}_{11}Na$$

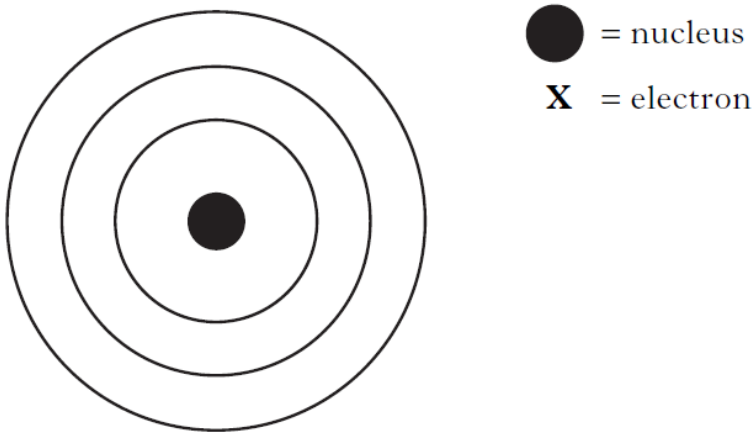
a) Complete the table to show the number of each type of particle in this sodium atom.

Particle	Number
electron	
proton	
neutron	

2

b) Electrons are arranged in energy levels.

i) Complete the diagram to show how the electrons are arranged in a sodium atom. (You may wish to use page 1 of the data booklet to help you.)



1

ii) Explain what holds the negatively charged electrons in place around the nucleus.

_____

_____ 1

c) Sodium atoms will easily form ions.

i) State the electron arrangement for a sodium ion.

_____ 1

ii) State the overall charge of a sodium ion.

_____ 1

12. There are three different types of silicon atom.

Type of atom	Number of protons	Number of neutrons
$^{28}_{14}Si$		
$^{29}_{14}Si$		
$^{30}_{14}Si$		

a) Complete the table to show the number of protons and neutrons in each type of silicon atom. 1

b) What name is used to describe these different types of silicon atom?

_____ 1

c) A natural sample of silicon has an average atomic mass of 28.11.

What is the mass number of the most common type of atom in the sample of silicon?

_____ 1

13. Complete the following table for each ion.

Ion	Number of protons	Number of neutrons	Number of electrons
$^{17}_{8}O^{2-}$	8		10
$^{7}_{3}Li^{+}$	3	4	
	12	13	10
$^{39}_{19}K^{+}$	19		
	15	16	18

6

Total Marks 28